

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A dual mode mirror imaging system comprising:
 - a Cassegrain-type objective assembly having a primary mirror with a hole in its center, and a secondary mirror spaced in front of the primary mirror; and
 - imager optics disposed in the hole in the center of the primary mirror,
 - the secondary mirror adapted to receive laser wavelength light and infrared wavelength light reflected from the primary mirror and to reflect the light back through the imager optics to a focal plane,
 - the secondary mirror having one reflecting surface for the laser light and another reflecting surface for the infrared light;
 - the pair of reflecting surfaces positioned to change the optical path length between the laser light and the infrared light so that the laser light and the infrared light are imaged at the same focal plane without defocusing.
2. The imaging system recited in claim 1 wherein the mirrors are aspheric mirrors.
3. The imaging system recited in claim 1 wherein the primary mirror is an aluminum mirror.
4. The imaging system recited in claim 1 wherein the secondary mirror is a convex mirror.

5. The imaging system recited in claim 4 wherein the secondary mirror is a Mangin mirror.
6. The imaging system recited in claim 1 wherein the secondary mirror is made out of germanium.
7. The imaging system recited in claim 6 wherein the backside of the secondary mirror is coated with silver.
8. The imaging system recited in claim 1 wherein the secondary mirror is 2mm thick.
9. The imaging system recited in claim 1 wherein the reflecting surfaces are aspheric.
10. The imaging system recited in claim 1 wherein the imager optics includes five lenses.
11. The imaging system recited in claim 10 wherein two of the lenses are made from zinc selenide.
12. The imaging system recited in claim 10 wherein three of the lenses are made from gallium arsenide.

13. The imaging system recited in claim 12 wherein one of the gallium arsenide lenses is a diffractive lens with a center wavelength of 4.1 microns.

14. The imaging system recited in claim 13 wherein the other lenses have spherical surfaces.

15. The imaging system recited in claim 1 wherein the mirrors are aspheric and the secondary mirror is a convex Mangin mirror.

16. The imaging system recited in claim 1 wherein the primary mirror is an aluminum mirror and the secondary mirror is made out of germanium.

17. The imaging system recited in claim 16 wherein the backside of the secondary mirror is coated with silver.

18. The imaging system recited in claim 17 wherein the reflecting surfaces are aspheric.

19. A dual mode mirror imaging system comprising:

a Cassegrain-type objective assembly having a primary aspheric aluminum mirror with a hole in its center, and a secondary aspheric convex Mangin mirror spaced in front of the primary mirror; and

imager optics including two zinc selenide lenses and three gallium arsenide lenses disposed in the hole in the center of the primary mirror, where one of the gallium arsenide lenses is a diffractive lens with a center wavelength of 4.1 microns,

the secondary mirror adapted to receive laser wavelength light and infrared wavelength light reflected from the primary mirror and to reflect the light back through the imager optics to a focal plane,

the secondary mirror having one germanium reflecting surface for the laser light and another silver reflecting surface for the infrared light;

the pair of reflecting surfaces positioned to change the optical path length between the laser light and the infrared light so that the laser light and the infrared light are imaged at the same focal plane without defocusing.

20. A dual mode mirror imaging method comprising the steps of:

reflecting laser wavelength and infrared wavelength light from a primary mirror of a Cassegrain-type objective assembly onto a secondary mirror of the Cassegrain-type objective assembly,

reflecting the laser light from one surface of the secondary mirror back through imager optics in a hole in the primary mirror to a focal plane; and

reflecting the infrared light from another surface of the secondary mirror back through imager optics in a hole in the primary mirror to a focal plane;

the pair of reflecting surfaces positioned to change the optical path length between the laser light and the infrared light so that the laser light and the infrared light are imaged at the same focal plane without defocusing.